Bielaczyc, K. (). Designing social infrastructure: The challenge of building computer-supported learning communities.

Social Infuastructure Related to learning communities

The central challenge lies in creating the appropriate *social infrastructure* around the tool. Social infrastructure refers to the supporting social structures enabling the desired interaction between collaborators using the CSCL tool.

(Bielaczyc & Collins, 1999; Collins & Bielaczyc, 1997) to examine the use of CSCL tools in building computer-supported learning communities.

Characteristics of learning communities

In recent years there has developed a “learning-communities” approach to education. There are four characteristics that a learning community must have: (1) diversity of expertise among its members, (2) a shared objective of continually advancing the collective knowledge and skills, (3) an emphasis on learning how to learn, and (4) mechanisms for sharing what is learned (Bielaczyc & Collins, 1999).

Project

In KnowledgeForum the goal is to engage students in progressive knowledge building, where they continually develop both their own and the community’s understanding through problem identification, research, and community discourse.

Three levels of social infactructure

Why does implementation of a CSCL tool result in the desired effects in some classroom contexts and not others? The real challenge lies in creating the appropriate *social infrastructure* around the tool. “Social infrastructure” refers to the supporting social structures enabling the desired interaction between collaborators using the CSCL tool. We focus on three levels of social infrastructure:

• *Cultural level*: What is the classroom culture in which the CSCL tool lives? What are the overall philosophy and norms established among the teacher(s) and students?

• *Activity level*: What are the classroom practices? In what ways do the offline learning activities complement the online activities with the CSCL tool?

• *Tool level*: How has the end-user modified the environment? How are the affordances of the CSCL tool actually used in practice?

Participants

Whitman Middle School, a small suburban school in the midwest United States. The Whitman Team consisted of four classrooms of roughly 25 students each, with each teacher specialising in one subject matter area: Math, Science, Language Arts, or Personal Development.

Method

Beginning in the Spring of 1999, classroom visits were made roughly every 6 weeks for a period of 5 days, and data collection included classroom observations, written and online data, and interviews. The present paper focuses on student investigations in three research units over the 99-00 school year.

Project

Students managed their own time during the KnowledgeForum period: conducting their investigations offline or working in the KnowledgeForum database.

Culture

the overall philosophy and norms established among teacher(s) and students.

The teachers described their main educational objective as fostering a “learning club,” and students referred to themselves as a “learning community,” where the goal was to learn how to be a good learner. The classroom norms included developing individual expertise, serving as learning resources for each other, respecting the ideas of others, and reflecting on the learning process.

Students entered 6th grade from a very different culture than the “learning club” that the Whitman Team was trying to develop.

The teachers and students had to start from scratch to define and refine their learning community over the two years that they were together. The teachers felt that it was only by their second year together that the class began to truly operate on a communal level. The longer that the students “lived” in the culture, the better able they were to establish and assimilate the relevant philosophy and norms.

Culture of Student interaction

ot only furthered one’s own knowledge building, but that could be used as resources by other students. Because interaction with others was valued in the culture, as students worked in the KnowledgeForum database they were expected to exchange ideas, build-on to the work of others, share resources, and work to build communal understanding.

they pointed out places where other students helped them or where they provided information or resources to others. In surveying students on whether other students helped them to build knowledge in KnowledgeForum, the students responses typically reflected this sense of communal exchange: “because whenever they find something I might need they tell me and they help me when I need to understand something.”

You can get your own research done without helping others, so why bother?” This question was typically met with an incredulous look, followed by an explanation of how they wouldn’t be a community if they didn’t help each other and of how working together helps one to learn much more than working on one’s own (this explanation was usually given in a patient tone of voice, as if the interviewer didn’t “get it.”).

one student commented that her entries in the KnowledgeForum database changed over time from reading other people’s Notes because (a) it became clear to her that there were expectations to interact with other students, and (b) she saw examples of how people helped each other in their investigations, and began to follow their examples herself. Thus, just as the classroom culture impacts activity in the KnowledgeForum database, in a complementary manner, the database can help reify the norms of the culture.

The teachers and students consistently worked to build a learning community both with and without KnowledgeForum.

Classroom Practices

There were three major classroom practices that impacted the social infrastructure existing around the use of KnowledgeForum:

• *Teaming*: In some units, students were formally grouped into teams meant to collaborate in their investigative efforts.

• *Face-to-Face Meetings*: At various points throughout the course of a research unit, students gathered for whole class or team-based discussions regarding their investigations.

• *Culminating Event*: At the end of each unit, students shared their learning with the rest of the class in a public activity.

Presentations

Most teams created presentations in which each member took a turn and presented his or her individual work.

Comparisons between Teaming Groups

Teaming fostered a sense of group identity and an incentive to engage in database interactions and communal knowledge building. In Unit 1, the discussion groups did not have the same formality and expectations of communal knowledge building as the team structures in Units 2 and 3.

Workspace Design

Even though the work of other students were only a mouse click or two away, the individualised nature of the workspaces militated against communal interactions in the database. As students worked in their workspaces, there were no cues regarding the work of other students in the database. In order to become aware of the knowledge building activities of others, students had to visit other Views. In contrast, in Units 2 and 3, the organisational structure of the Views corresponded more closely to the communal knowledge building that was intended: the team-based Views collected together all of the individual Notes of the team members, as well as providing a communal space for housing the multiply-authored Notes created by members of the team. The visual real-estate of the View allowed students to watch the knowledge building activities of others on their team. Further, sharing a common space with one’s team members reified the notion that the team is engaged in common work.

Even if we create CSCL tools with amazing functionality, unless we build social infrastructures that permit them to be used to their full potential, we will not produce effective learning environments for students.

Our analysis suggests three levels of social infrastructure are important to successful use of CSCL tools: the Cultural Level, the Activity Level, and the Tool Level. At the Cultural Level, issues of classroom philosophy, goals, and norms are central. At the Activity Level, issues of the participant structures and culminating events are central. At the Tool Level, issues concerning the use and adaptation of different tool capabilities are central. While we did not have space to consider them here, other components, such as the teacher’s role, the level of curriculum integration, and the curriculum content, are also critical

Aronson, E. (1978). *The jigsaw classroom.* Beverly Hills, CA: Sage.